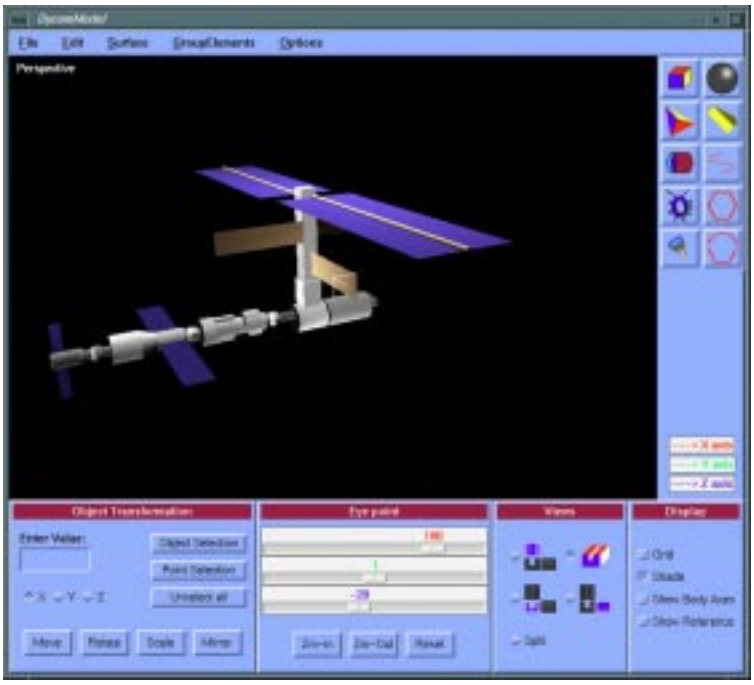
Putting the Flex in Flexible

Commercial Benefits—Spinoffs

Image processing and 3-D graphics tools created for the International Space Station serve double-duty by helping Hollywood with special effects, animation, and colorization of old black-and-white television shows and movies.

Dynacs Engineering Company, Inc., is a minority-owned, Small Business Administration-certified engineering company located in Palm Harbor, Florida. In support of NASA programs, Dynacs made advancements in multiprocessor-based computers and software technologies. This work includes symbolic equation processing, graphical user interfaces, and computer animation.

Dynacs Engineering has earned a reputation for its technical capabilities in engineering analysis and modeling of aerospace multibody structural dynamics. Using Dynacs-developed software, a computer model of the Space Shuttle's multi-jointed robotic arm was created. This software-generated model proved highly accurate when ground simulations were contrasted with both original manufacturer data and actual data taken during Shuttle missions.



Dynacs Engineering Company, Inc.'s Dycom is a multibody dynamics and control system simulation tool.

Two Dynacs software products, originally designed for NASA, have been commercialized. GenSoft is a code generation tool. It automatically generates Fortran and C code for mathematical equations. GenSoft was originally used by Johnson Space Center for Space Station simulation. Marketing of the software as a commercial product started in 1993. The product found commercial acceptance in the aerospace world and is in use by prime spacecraft contractors.

A second product, Dycom, was first designed at Marshall Space Flight Center in 1985. Originally called TREETOPS, this computer code was formulated to analyze and design controllers for a number of large space systems, including the Hubble Space Telescope. TREETOPS is capable of simulating the dynamics and control of flexible systems as complex as the Space Station, robot tasks and manipulations, and the rendezvous and docking of spacecraft.

Dynacs was funded to further enhance the software, with the firm acquiring the TREETOPS copyright in 1994. The resulting Dycom software package is now used on such projects as the Space Station, as well as by federal agencies and contractors, including the Defense Department, the U.S. Navy, Lockheed Martin, and the Aerospace Corporation.

Dycom is a multibody dynamics and control system simulation tool. It provides an integrated software environment to perform kinematic and dynamic analysis of space structures and robot manipulators and mechanisms, including their control elements. Dycom users can graphically construct models of mechanical systems, specify forces, torque, and other conditions. The animation package allows zooming into areas of interest. Variations in viewpoint as well as lighting conditions can also be displayed.

Dycom consists of a suite of software tools, all working together in an integrated environment. This powerful product has been made commercially available by Dynacs Engineering. Portions of the software have been adopted by the medical and entertainment industries. In the arena of medical application, Dycom code has been tasked with medical imaging using computed tomography scanners.

NASA has recognized Dynacs for its contributions to space projects on several occasions. In 1997, the firm earned the space agency's Small Disadvantaged Business Prime Contractor of the Year award. The following year, the Johnson Space Center bestowed Dynacs with the Small Disadvantaged Business Contractor of the Year award for the company's contribution to the Space Station team. ❖